

REMARKS

This is a response to the Office Action mailed October 9, 2003 in relation to the above-identified patent application.

Item 1. (Page 2, line 1 to line 4):

Rejection of claims 9 and 10 because “the polarization rotator” in claims 9 and 10 lacks proper antecedent basis.

It is respectfully submitted that in paragraph [0119] of the specification “polarization rotator” and its function have been described as “polarization rotators (such as half-wave waveplates) may be used to align the parallel component and/or orthogonal component such that the required orientation angles are provided”. In previous paragraphs [0053], [0054], [0071], [0072], and [0094], the orientation angle (or angular orientation) has been described as the relative orientation between the polarization direction of an optical light and a birefringent element.

Claims 9 and 10 have been cancelled without prejudice.

Items 2 & 3 (Page 2, line 5 to end of page 2):

Rejection of Claims 1, 2, 8, 9, 11, and 16 Under 35 U.S.C. 102(b) as being anticipated by Jameson (5,033,830)

It is respectful to submit that the cited reference above (5,033,830) discussed optical isolators and it does not disclose an interleaver. When a light pass through the optical isolators in Jameson’s patent from its input to its output, the optical isolating device is to prevent reflection light propagate backward from the output to the input. An optical isolator consists of one input port and one output port as described in Jameson’s patent (see column 3, line 58-59; column 4, line 58-66 and Figs. 1, 4, 5, and 6, element 12, 28).

In comparison, as described in paragraphs [0003]-[0009] of the specification of this patent application, an interleaver is to separate an input optical beam into two optical beams of interleaved optical wavelengths. An interleaver consists of one input port and two output ports. Claims 1, 2, 8, 9, 11 and 16 are specific claims for “interleaver” while all of Jameson’s claims are specific ones for “optical isolator”.

It is respectful to request that the rejection of claims 1, 2, 8, 9, 11 and 16 as being anticipated by Jameson's patent 5,033,830 can be withdrawn.

Item 4 (Page 3, line 1 to line 7):

Rejection of Claims 1, 2, 5-8, 10, 11, 14 and 16-18 Under 35 U.S.C. 102(b) as being anticipated by Cheng (5,768,005)

It is respectful to submit that the cited reference above (5,768,005) discussed optical isolating devices (i.e., optical isolator) and it does not disclose an interleaver. When a light pass through the optical isolating device in Cheng's patent ('005) from its input to its output, the optical isolating device is to prevent reflection light propagate backward from the output to the input. An optical isolating device consists of one input port and one output port as described in Cheng's patent (see column 3, line 20-25 and Figs. 1a, 2a, 3, and 6).

In comparison, as described in paragraphs [0003]-[0009] of the specification of this patent application, an interleaver is to separate an input optical beam into two optical beams of interleaved optical wavelengths. An interleaver consists of one input port and two output ports. Claims 1, 2, 5-8, 10, 11, 14 and 16-18 are specific claims for "interleaver" while all of Cheng's claims are specific ones for "optical isolating device".

It is respectful to request that the rejection of claims 1, 2, 5-8, 10, 11, 14 and 16-18 as being anticipated by Cheng's patent 5,768,005 can be withdrawn.

Item 5 (Page 3, line 8 to line 14):

Rejection of Claims 1, 2, 5, 6, 8, 11, 12, 14, and 16-18 Under 35 U.S.C. 102(b) as being anticipated by Cheng (5,471,340)

It is respectful to submit that the cited reference above (5,471,340) discussed optical non-reciprocal devices and it does not disclose an interleaver. The functionality of the optical non-reciprocal devices is completely different from an interleaver, which is summarized in Cheng's patent ('340) col. 1, lines 41-61 as:

"According to the present invention there is provided an optical non-reciprocal device for coupling light beams between a plurality of ports, the device comprising at least a first port and a second port at one end of the device, mirror means at an opposite end of the device and, disposed between the plurality of ports and the mirror means, optical elements for spatially separating first

and second components of a light beam leaving said first port, conveying the first and second components non-reciprocally to and from the mirror means such that the first and second components travel along first and second paths, respectively, recombining said first and second components, and coupling the recombined light beam to the second port.” and

“The optical elements are so configured that a second light beam leaving the second port will be separated into first and second polarization components. The first and second polarization components of the second light beam will travel along third and fourth paths, respectively, and be recombined at a position at said one end of the device, which position is spaced from both the first port and the second port in a plane extending through the first and second ports.”

Although the optical non-reciprocal device can consist of multiple ports for input and output, from col. 1, lines 41-61 of Cheng’s patent (‘340), it is clearly indicated that for one input light to a port, there is only one output light at another port for the non-reciprocal device. Which output port is used for output port is determined by which input port is used for input light in the non-reciprocal device. In the non-reciprocal devices, there is a one-to-one relationship between one input port and one output port when device is functioning.

In comparison, when one input light is injected at the input of an interleaver, there are two output optical beams coming out of the interleaver, each output optical beam consists of a group optical components of interleaved wavelength, as described in paragraphs [0003]-[0009] of the specification of this patent application. Cheng’s patent (‘340) does not disclose the interleaver functionality (i.e., separating an input optical beam per wavelength into two output beams). Claims 1, 2, 5, 6, 8, 11, 12, 14, and 16-18 are specific claims for “interleaver”.

It is respectful to request that the rejection of claims 1, 2, 5, 6, 8, 11, 12, 14, and 16-18 as being anticipated by Cheng’s patent 5,471,340 can be withdrawn.

Item 6 (Page 3, line 15 to Page 4, line 2):

Rejection of Claims 1, 2, 8, 11, and 16 Under 35 U.S.C. 102 (e) as being anticipated by Li (6, 212,313)

Claims 1-5, 7-11, 16-18 are cancelled.

Claim 6 has been amended as an independent claim. Li (6,212,313) did not teach how to construct the birefringent assembly (the phase delays and angular orientations) as the amended

claim 6 does in order to obtain a flat transmission near the channel center wavelength as shown in FIG. 8 in this patent application.

Claims 12 and 13 are amended such that they are dependent claims to claim 6.

Claim 14 has been amended as an independent claim with specific definition on how to construct the birefringent elements of two birefringent elements from Table III. Supporting materials for this claim can be found in specification paragraphs [0120] and [0133]. Claim 15 is amended as a dependent claim to claim 14.

It is respectful to request that amended claims 6, 12, 13, 14, and 15 are allowed.

Items 7 & 8 (Page 4, line 3 to page 5, line 8):

Rejection of Claims 3, 4, 7, and 9 Under 35 U.S.C. 102 (e) as being anticipated by Li (6, 212,313)

Claims 3, 4, 7 and 9 have been cancelled without prejudice.

Items 9 & 10 (Page 5, line 9 to page 6, line 12):

Double Patenting Rejection of claims 1, 2, 5, and 6

It is respectful to submit that US patent 6, 563,641 does not teach a table listing the general relationship among phase delay, orientation angle and the state of polarization as Table III in this patent application.

A terminal disclaimer which disclaims the terminal portion of any patent issuing on the subject patent application that extends beyond the termination of U.S. patent 6,563,641 and which requires co-ownership of such patents is provided herewith to obviate the double patenting rejection of the subject patent application.

Item 11 (Page, line 13 to line 15):

Elements 55 and 56, in Fig. 25, each lack a proper written description

On the bottom left side of the figure 25, a box shows the parts and their functionality. Element 55 are half-wave waveplates and element 56 is quarter-wave waveplate. Appropriate correction to the specification has been made to describe elements 55 and 56 in paragraph [0110] of the specification.

Correction to Typos in Table III for Claim 6:

In the patent publication US 2003/0025998 A1 (Feb. 6, 2003), there are four typos for Table III under claim 6 and paragraph [0143]:

“100₁” (happened at two places) should be “ φ_1 ” and “100₃”(happened at two places) should be “ φ_3 ”, respectively.

Table III in the specification paragraph [0129] is correct. Please help to make correction if this application is allowed to issue.


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